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DE-OS 21 39 283  
DE-OS 15 09 841  
DE-GM 19 26 399  
FR 21 02 505  
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(54) Removable Floor Covering

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# Patent Claims

1. Removable floor covering made of individual rectangular sheets of the same size out of wood, particle board or fiber material or similar materials that are connected with each other at their respective edges and on which a continuous profile bar extend across the length of the edge, which is actually part of a set of profile bars that interact with each other and can be connected with each other crosswise, is fastened on the edges of neighboring sheets, which are supposed to be connected with each other, characterized by the following features:

- a) the sheets (1,2) are arranged parallel to one rectangular side in a row (23) one after the other, but are offset in the row (24) that is adjacent to the crosswise direction in the direction of the row;
- b) the edges (25) of the sheets (1,2) that are parallel to the direction of the rows (23, 24) are equipped with connecting features (100) on which the first profile bar (10) has a recess (14) - open toward the outside, running in the longitudinal direction - which forms an undercut (19) in the direction that faces away from the front (7) of the sheet (1) and forms an undercut (17) in the direction that is vertical to the sheet plane, and on which the second profile bar (10') on the sheet (2) is equipped with a tongue (15) that can be inserted flush both behind the undercut (19) and beneath the undercut (17) when swiveling the sheet (2) around an axis that is parallel to the profile bars (10, 10') and is propped against the first profile bar in the opposite direction in such a way that the sheets (1, 2) are coupled with each other in both directions that are vertical to the profile direction, i.e. parallel and vertical to the sheet plane;
- c) the edges (26) that are vertical to the edges (25) are equipped with connecting features (200) with profile bars (10, 10") that interact with each other, with the bars being able to be mesh - when inserting them vertically to the sheet plane when lowering the sheet (2) - in such a way that they are coupled with each other parallel to the sheet plane.

2. Floor covering in accordance with Claim 1, characterized by the fact that the profile bars (10, 10', 10") are fastened with a flat profile rail (9) that is incorporated roughly in the center of the sheet's thickness, equipped with a barb-like longitudinal profile (11) on at least one flat side and meshes with a longitudinal slot (8) in the front (7) of the sheet (1, 2) when under stress as well as with a flat profile rail (12) that is provided near the sheet's bottom, runs parallel to the sheet plane and laps over the sheet edge.

## Description

The invention relates to a removable floor covering of the generic kind described in Claim 1.

The starting point for the invention is represented by problems that occurred with removable dance floors,

which are placed on top of existing floors such as carpet or floors in sports gyms or similar facilities for events and which are removed again after the event. Such dance floors consist of rectangular sheets, which are joined together at their edges. They must stay together as an overall gap-less, homogeneous surface without outward fasteners.

It has been known to join the individual sheets together with a simple tongue-and-groove joint. With this design, however, the risk exists that the sheets can slide apart a little and form a gap, which can lead to accidents when dancing. We also know of fasteners that hold the sheets together in their plane. In one familiar design, a grub screw is pushed crosswise through the tongue-and-groove joint. Their effectiveness however is limited because the load is transmitted only in certain points, and the edges of the sheets of wood or particleboard are not suited for transmitting any load worth mentioning, especially when nut and groove have been incorporated. One version that was further developed provides for hooks in the sheet plane that reach to the outside into the neighboring sheet and push it against the first sheet when actuating a cam. This version as well only provides load transmission in particular points and requires additionally considerable efforts since the cam components have to be inserted into the edges of the sheets. In both cases, the access holes to the screws or the cam are visible from the outside and can become covered with dirt.

One removable floor covering of the generic kind described in Claim 1 is known from DE-OS 21 39 283. Here, the sheets are connected via profile bars that run along the edges of the sheets, i.e. across a certain length and no longer in particular points. The profile bars can be connected with each other by joining them in the direction that is vertical to the sheet plane. The connection, however, can be released - in part or completely - by applying load onto one of the neighboring sheets when the ground is soft or uneven. Temporary or permanent steps could be created, which must absolutely be avoided when the floor covering is used as a dance floor.

The invention is based on the task of designing a floor covering of the generic kind described in Claim 1 in such a way that the sheets can be assembled to a smooth overall surface without using tools so that the formation of steps on the edges of neighboring sheets is suppressed.

This task is resolved by the invention with the features described by the characteristics in Claim 1.

On the described design of the sheets it is sufficient to provide the connecting features, which enable fastening vertical and parallel to the sheet plane, only on two opposing rectangular sides. When offsetting the sheets, they are still connected across their entire surface with the invented connecting feature

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and held down so that individual sheet corners cannot form lips or so that steps cannot be created.

A profile design for connecting sheet edges that works vertically and parallel to the sheet plane is known as such already from DE-OS 22 38 660.

Of course, it is important to connect the profile bars with the actual sheets in a way that does not put any load on its edges since otherwise the advantage that the edges are not part of the actual connection is not taken into consideration, and the problem is actually only moved further inward.

A beneficial connecting feature that fulfills the purpose of the invention is described in Claim 2.

The profile rail bearing a barb-like longitudinal profile, which generally has a so-called "fir tree" design, assumes a major portion of fastening the profile bars vertically to the sheet plane. The profile rail that reaches across the sheet edge, which in the case of floor covering sheets, should, of course, be arranged on the bottom of the sheets, offers the possibility of securing the profile bar from pulling it out of the groove, into which the profile rail that is equipped with the barb-like longitudinal profiles meshes. Additionally, the other profile rail, of course, also contributes to further fastening, vertical to the sheet plane.

The drawing depicts two versions of the invented floor covering that is to serve as a dance floor covering.

Fig. 1 and 2 show vertical partial sections, vertical to the way the edge stretches;

Fig. 3 depicts a section of the invented dance floor covering from the top;

Fig. 4 shows a vertical partial section, vertical to the way the edge stretches, with a supplemental connecting feature:

The sheets 1, 2 of a dance floor covering are connected with each other at their edges with connecting features 100, 200 (fig. 3). The sheets 1, 2 have several layers and a parquet layer 3 on top, which is applied onto a center layer 4 of wood core plywood, particleboard or similar materials. A plywood layer 5 forms the bottom.

The connecting feature 100 comprises two profile bars 10, 10', which are arranged on the fronts of the sheets 1, 2. The profile bars 10, 10' extend roughly across the height of the center layer 4 and the bottom layer 5 and end with the upper side of the center layer 4 so that the parquet layer 3 can extend beyond the profile bars 10, 10' and the parquet layers 3 of neighboring sheets 1, 2 join directly in the line 6 so that the profile bars 10, 10' cannot be viewed from the top.

The center layer 4 and the bottom layer 5 form a joint front 7, into which a rectangular groove 8 is milled, which is located roughly in the center of the overall thickness of the layers 4, 5. At their backs, the profile bars 10, 10' rest against the front 7 and have a flat profile rail 9 that catches the groove 8 and is equipped on both sides with a longitudinal profile 11 in the form of ribs of triangular cross-section. The profile rail 9 is under stress in the groove 8. As far as the profile rail 9 is concerned, the design of both profile bars 10, 11 is the same. This also applies with regard to another profile rail 12, in the form of a flat profile lug that reaches beneath the sheets 1, 2 and extends a little beyond the profile rail 9.

The profile rail 12 can be connected with the bottom of the sheets 1, 2 with screws or nails or by gluing it down. It protrudes from the bottom of the sheets by the dimension of its thickness 12. This difference in height is compensated by placing the sheets 1, 2 onto felt strips or similar liners on the load-bearing surface.

The profile bars 10, 11 have differing designs. The profile bar 10 is equipped with a recess 14, which is caught by one tongue 15 of the profile bar 10'. As can be seen in Fig. 1, the sheets 1, 2 can be joined by tilting the sheet 2 when the left sheet 1 is on the floor, i.e. sheet 2 is lifted on the right side shown in Fig. 1, and then inserting the tongue 15 into the recess 4. When the sheet 2 is lowered on the right and placed onto the load-bearing surface, the profile bars 10, 10' mesh with each other.

This is explained in detail on the profile bars 10, 10' in Fig. 2. Together with the profile rail 16, which limits the recess 14 to the top, the profile bar 10 forms an undercut 7, underneath which the tongue 15 reaches as shown in Fig. 2. The profile rail 18 limits the recess 14 in Fig. 2 to the right and forms an undercut 19, against which the back of the tongue 15 rests. In accordance with Fig. 2, the tongue 15 therefore cannot be pulled out of the recess 15, neither to the top or to the right. In the opposite direction, i.e. to the bottom and to the left, the profile bar 10' is also stopped by the profile bar 10 or its profile rail 18 so that in the position depicted all-round fastening in the drawing plane of Fig. 1, 2 is provided.

The profile bars 10, 10' however can be moved vertically to the drawing plane. If this is to be prevented, both profile bars 10, 10' can be equipped with bores 20 (Fig. 1), into which a locking pin 21 can be inserted.

With regard to the design of the profile bars 10, 10', the versions of Fig. 1 and 2 are the same. The version in Fig. 2 however differs from that in Fig. 1 in that the parquet layer 3' does not cover the profile bars 10, 10', but only extends up to the front 22. The upper side of the parquet layer and the upper side of both profile bars 10, 10' are located in one plane.

On the bottom, the profile bars 10, 10' with the flat profile rails 12 do not protrude over the bottom of the plywood layer 9', but are flush with it. This means that a recess that holds the profile rails 12 must be milled into the plywood layer 5'.

Fig. 3 shows that in order to form the dance floor covering, the sheets 1, 2 are arranged in rows 23, 24 one after the other and that the sheets 1, 2 of the neighboring rows 23, 24 are offset in the direction of the rows. For this particular design, the connecting features 100 are only required on the edges 25 of the sheets 1, 2 that run parallel to the direction of the rows 23, 24. Even if the sheets 1 or the edges 26 vertical to them are not connected, sufficient cohesion of the dance floor covering is provided for some applications.

For demanding applications of the sheets' connection, however, particularly when they are placed onto flexible ground such as carpeting, the edges 26 must be connected with each other in order to avoid that they slide apart along the edges 25. This is why the simplified connecting feature

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200 from Fig. 4 has been incorporated, which comprises a profile bar 10 as described in Fig. 1 and 2 and a profile bar 10", which differs from the profile bar 10' in that it is not equipped with a tongue 15 that reaches beneath the undercut 17, but rather with an outer 'wall' 27 that runs vertically to the sheet plane. Due to this, the profile bars 10, 10" can mesh in the way depicted in Fig. 4 with a movement that runs exclusively vertically to the sheet plane, as required for geometrical reasons if the sheets 1, 2 are supposed to be connected all the way around and equipped with the connecting feature 100 at the edges 25.

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1 Sheet Drawings

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Drawings Sheet 1

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